REMARKS

In the Office Action of November 30, 2005, Examiner rejected Claims 11 and 15-16 under 35 USC § 102 as being anticipated by U.S. Patent 5,990,928 ("Sklar"). Under 35 USC § 103(a), Examiner rejected Claim 13 as being unpatentable over Sklar in view of U.S. Patent 6,166,686 ("Lazar"), Claim 14 as being unpatentable over Sklar, Claims 1-6, 8-10 and 12 as being unpatentable over Sklar in view of U.S. Patent 6,018,659 ("Ayyagari") and U.S. Patent 5,764,185 ("Fukushima"), and Claim 7 as being unpatentable over Sklar, Ayyagari, and Fukushima, further in view of U.S. Patent 5,526,022 ("Donahue").

Applicant respectfully traverses the rejections and submits the following arguments. Applicant will argue in significant detail that Examiner misinterpreted Fukushima when Examiner asserted that Fukushima disclosed a closed-loop controller initiated on the basis of a received signal level. Applicant will demonstrate that Fukushima clearly does not contemplate initiating a closed-loop controller on the basis of a received signal level. Applicant will then distinguish the cited prior art with respect to Applicant's unique combination of open and closed-loop control. In conjunction therewith, Applicant will discuss the heretofore-unrealized advantages of combining Applicant's control system with electronic and mechanical means of pointing a direct broadcast satellite ("DBS") antenna.

Interpretation of Fukushima Closed-Loop Control Initiation

On page 3 of the Office Action dated November 30, 2005, Examiner cited the following sentence from Fukushima:

> The closed-loop controller 18 responds to the command for starting the closed-loop operation on the basis of a receiving signal level. Fukushima column 6, lines 43-45.

Applicant respectfully disagrees with Examiner's interpretation of this sentence and will demonstrate that in the context of the paragraph surrounding the cited sentence, Fukushima and indeed the entire reference, the Examiner's interpretation is incorrect. Applicant will show that the correct interpretation of the above referenced sentence is that the modifier "on the basis of a

receiving signal level" modifies the term "closed-loop operation" and not the term "starting." In other words, the quoted sentence from Fukushima should correctly be interpreted as:

> The closed-loop controller 18 responds to the command for starting the closed-loop control. Once started, the closed-loop control then operates on the basis of a receiving signal level.

Applicant's first argument regarding the interpretation of the cited sentence is that when taken in the context of the sentence immediately preceding the cited sentence, and applying standard antecedent language principles, Applicant's interpretation is clearly correct. The two sentences together read:

> If the accumulated value from the angle accumulator 20 is higher than this threshold, the accumulated angle judgment section 21 commands the closed-loop controller 18 to start closed-loop control. The closed-loop controller 18 responds to the command for starting the closed-loop operation on the basis of a receiving signal level. Fukushima column 6, lines 40-45 (emphasis added).

From this excerpt, it is clear that the phrase "the command" in the sentence cited by the Examiner is referring to the command discussed in the immediately preceding sentence. The word "the" before "command" implies that there is an antecedent basis for the use of "command" in the sentence cited by the Examiner. Therefore proper interpretation requires that the antecedent basis be used in interpretation. In this context "the command" in the cited sentence clearly refers to the command from the accumulated angle judgment section to start closed-loop control discussed in the immediately preceding sentence. Therefore, "the command" in the cited sentence originates from the accumulated angle judgment section, which by its nature as discussed throughout Fukushima, and by its name, clearly originates commands based on accumulated angle and not based on a receiving signal level.

To interpret the sentence as proposed by the Examiner creates a direct operational conflict between the sentence cited by the Examiner and the immediately preceding sentence, and indeed the

rest of the Fukushima reference. That is, the Examiner's interpretation would require an operation that is inconsistent with an operational requirement clearly set forth in the immediately preceding sentence, i.e. that the closed-loop control is started on the basis of an accumulated angle (as opposed to starting on the basis of a receiving signal level). The only proper interpretation then, and the only one that results in harmony between the two sentences, is that the closed-loop operation starts on the basis of and then operates on the basis of receiving signal level.

As discussed throughout Fukushima, and by Applicant in the sections that follow, the accumulated angle judgment section bases its action to command the closed-loop controller to start closed-loop control on whether or not the system has accumulated a certain level of sensed angular motion. Nowhere in Fukushima is it stated that the accumulated angle judgment section makes decisions on the basis of a receiving signal level. By its very name, the accumulated angle judgment section implies that its decisions are made on the basis of an accumulated angle, and it in fact does make its decisions on the basis of an accumulated angle.

To further review precisely what Fukushima discloses with respect to the starting of the closed-loop control, the larger context in which the sentence appears (i.e. the entire paragraph in which the sentence occurs and the entire application) must be closely reviewed. The cited sentence must be examined in reference to the entire paragraph of which it is a part. The following immediately precedes the sentence in Fukushima:

> The angle accumulator 20 sequentially accumulates turning angles obtained by the angle calculator 15 and the thus obtained accumulated value is then compared with a given threshold by the accumulated angle judgment section 21. If the accumulated value from the angle accumulator 20 is higher than this threshold, the accumulated angle judgment section 21 commands the closed-loop controller 18 to start closed-loop control. Fukushima column 6, lines 36-43, emphasis added.

This entire passage is contemplating starting the closed-loop controller based on accumulated angle. The first sentence pertains to the parameters that the accumulated angle judgment section bases its decisions on, i.e. it compares accumulated turning angles to a given threshold. The next sentence describes what the accumulated angle judgment section does when the accumulated turning angle

reaches a given threshold, i.e. it commands the closed-loop controller to start closed-loop control. Therefore, Applicant's interpretation is clearly correct in the larger context of the entire paragraph in which the cited sentence is found.

Another important distinction is that the cited sentence uses the term "receiving signal level" and not "received signal level." "Receiving" implies an ongoing process such as the closed-loop controller functions based on receiving signals. "Received" implies a one-time process such as the closed-loop controller starts based on a received signal level. This is consistent with Applicant's interpretation of the cited sentence. Furthermore the sentence following the cited sentence describes how the closed-loop control operates:

> More particularly, the closed-loop controller 18 calculates an offset on the basis of a receiving signal level detected by the transceiver 2 (i.e., the level of a target's signal received by the antenna 10). Fukushima column 6, lines 45-48.

This sentence is describing how the closed-loop controller functions; i.e. the closed-loop controller functions by calculating an offset "on the basis of a receiving signal level." Therefore, "More particularly" is referring to how the closed-loop controller operates in the previous sentence (i.e. the cited sentence). Since the sentence following the cited sentence uses the phrase "more particularly" in reference to the operation of the closed-loop controller "on the basis of a receiving signal level," the only reasonable interpretation left available for the cited sentence is that it too uses the phrase "on the basis of a receiving signal level" in reference to how the closed-loop controller operates and not in reference to how the closed-loop controller starts. Therefore, the sentences immediately preceding and following the cited sentence support Applicant's interpretation and do not support Examiner's interpretation.

Also, the cited sentence must be examined in reference to the application as a whole. A thorough examination of Fukushima reveals multiple examples of the closed-loop controller starting in response to factors other than the received satellite signal level. In fact, no sentence in Fukushima could reasonably be interpreted to imply that the closed-loop controller starts in response to a received satellite signal level. Several representative instances of closed-loop starting discussed in

Fukushima will be addressed in turn. Also, several instances of how the closed-loop control functions after it has been started will be addressed.

Fukushima states when describing an aspect of the invention that open-loop control is performed until an accumulated angle exceeds a threshold and then the next step in the method is "performing the closed-loop control ... of the motor on the basis of a target signal receiving condition." Column 2, lines 47-50. The starting of the closed-loop control in this reference is triggered by an accumulated angle and not received signals. Also, it is clear that the operation of the closed-loop control is based on signal level.

Then Fukushima presents an alternative way of starting closed-loop control. Fukushima states when describing another aspect of the invention that open-loop control is performed until a "predetermined time period has passed" followed by the step of "performing the closed-loop control ... of the motor on the basis of a target signal receiving condition." Column 2, lines 63-66. The starting of the closed-loop control in this reference is triggered by passage of an amount of time and not received signals. Also, it is clear that the operation of the closed-loop control is based on signal level.

Fukushima then goes on to state in unequivocal terms:

> [T]he closed-loop control is executed when a predetermined condition is fulfilled ... when the accumulated turning angle exceeds the second threshold ... [or alternatively] when a predetermined time has passed after termination of the closed-loop control. Fukushima column 3, lines 19-28.

There is no mention in this description, whose main focus is to discuss how closed-loop control is initiated, of starting closed-loop control based on signal level. Indeed, Fukushima clearly restates the only two ways of starting closed-loop control that are discussed in the entire patent: based on accumulated angle error and based on passage of a predetermined time.

Other examples where Fukushima discusses starting closed-loop control include:

> "the accumulated angle judgment section 21 commands the closed-loop controller 18 to start closed-loop control," column 6, lines 41-43;

"by starting the closed-loop control in response to the detection of the fact that the accumulated value from the angle accumulator 20 exceeds 60 degrees," column 7, lines 15-17;

"the closed-loop starter... uses the output of the tracking duration counter 22, i.e. the closed-loop starter 16 provides a command to the closed-loop controller 18 for starting closed-loop control if the duration of the tracking counted by the tracking duration counter 22 exceeds, by a given time, the time at which the closed-loop control was terminated," column 7, lines 38-44;

"a closed-loop control will be started only when a given time has passed," column 7, lines 45-46; and

"the closed-loop starter 16 then detects that six minutes has passed after termination of the closed-loop control and restarts closed-loop control," column 7, lines 56-58.

All of these references show instances where the closed-loop controller is started by a means other than the received signal. Conversely, no statement in Fukushima describes a closed-loop controller starting on a basis of a received satellite signal.

The closed-loop control of the antenna may be stopped on the basis of a received satellite signal level:

> [T]he control mode may be shifted ... from the mode where the closed-loop control is performed ... when the target signal receiving condition is improved to be equal to or higher than the third threshold." Fukushima column 3, lines 30-35.

The capability of the closed-loop starter to turn off the closed-loop controller is the reason why the closed-loop starters depicted in figs. 3, 4 and 5 of Fukushima show an output from the received level of the signal. The received level of the signal is not used to turn on the closed-loop control, but only to turn off the closed-loop controller. As stated in the text referring to figure 4, for example, Fukushima states:

> When the accumulated angle judgment section 21 detects such a sufficiently low pointing error from the receiving signal level, it commands the closed-loop controller 18 to terminate the closed-loop control. Fukushima column 6, lines 60-63.

There is no discussion in Fukushima, when referring to the figures or in any other context, of starting closed-loop control on the basis of received signal level. From the figures, it can be seen that the closed-loop starter relies on inputs from an angle calculator, an angle accumulator, or a counter to start the closed-loop controller.

Finally, as an aid to interpreting the Fukushima specification, an examination of the claims shows that in Fukushima Claims 2, 5, 6, 10 and 11, Fukushima performs closed-loop control of the motor on the basis of a target signal receiving condition in response to a completion of a previous step. Those steps are: performing open-loop control until an accumulated turning angle exceeds a threshold (Claims 2, 5 and 10) or performing open-loop control until a predetermined time has passed (Claims 3, 5 and 11). The fact that Fukushima claims starting closed-loop control only on the basis of an accumulated turning angle or passage of a predetermined time specifically reinforces Applicant's argument that Fukushima does not contemplate starting closed-loop control on the basis of received signal level.

In light of the numerous references cited above where the closed-loop control of Fukushima is started on a basis other than that of a receiving signal level and the lack of any clear statement in Fukushima declaring that closed-loop control is started on the basis of a received signal level, Applicant respectfully disagrees with Examiner's assertion that Fukushima discloses a closed-loop controller starting, on the basis of a receiving signal level, closed-loop operation.

Rejection of Claims 1-10 and 12 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Fukushima

As established above, Fukushima does not disclose a system which activates closed-loop operation based on a target signal receiving condition. Therefore, the rejection of Claims 1 and 12 by Examiner in the Office Action is erroneous.

Further, it should be noted that Fukushima in large part is oriented toward reducing power consumption as opposed to maximizing signal integrity. Fukushima, column 1, lines 53-54. On the

other hand, Applicant's Claims 1 and 12 are in large part oriented to accurately tracking a satellite signal when a signal is either being received or not being received. More particularly, the signal lock of the systems claimed in Claims 1 and 12 provides for activation of closed-loop control in response to a received satellite signal, and then the system operates in closed-loop control to maximize antenna pointing accuracy. If closed-loop control is lost (i.e. the satellite signal is lost), the systems rely on GPS position data, sensor orientation data, and satellite location data to point the antenna in the absence of a received satellite signal. This has the advantage that when whatever caused the satellite signal to be lost is corrected (for example, the satellite signal is no longer blocked by a building or mountain) the open-loop control has aligned the antenna so that satellite signal reacquisition time is reduced.

The control system of Applicant's claimed embodiments have significant advantages over each prior art reference cited by Examiner individually, and such embodiments are not rendered obvious by the combinations cited by Examiner in the §103(a) rejections. Sklar discloses a system which incorporates open-loop control, but does not disclose a closed-loop control or recognize any need for a closed-loop control. Ayyagari makes no disclosure as to whether or not, much less how satellite tracking is accomplished in the event a signal is lost. In short, no motivation is provided by the cited references to combine said references to reject Applicant's claims.

Of particular importance, and as discussed above, an objective of Fukushima is to reduce power consumption in a satellite signal tracking system. Applicant submits that Fukushima accomplishes this by actually sacrificing received signal strength to reduce power consumption. In repeated instances throughout Fukushima, the reference discusses the accumulation or increase of antenna pointing error and the accompanying degradation of received signal strength. For example, Fukushima states:

> [T]he accumulated turning angle and passed time after termination of the closed loop control indirectly represent the pointing error of the antenna. Fukushima column 3, lines 45-47.

In short, Fukushima is utilizing open-loop control in place of closed-loop control to the detriment of antenna pointing accuracy. Applicant's Claims are oriented to maximizing antenna pointing

accuracy under any condition, i.e. whether or not a satellite signal is being received. Since Fukushima is oriented toward reducing power consumption, Fukushima does not contain a motivation to combine with Sklar. In fact, since a combination with Sklar would seemingly increase power consumption, Fukushima teaches away from such a combination. In addition to Examiner's incorrect interpretation of Fukushima as discussed above, it was inappropriate for Fukushima to be combined with Sklar in the first place.

Regarding Examiner's combination of Sklar and Ayyagari to form the basis, at least in part, for the §103(a) rejection of Claims 1-10 and 12, Applicant asserts that the combination was improper both for the reasons stated in Applicant's Amendment and Response of May 13, 2005 and for the reasons immediately following.

In the Office Action, in a discussion related to a one dimensionally electronically pointable antenna mounted upon a motorized turntable, Examiner introduced prior art that only referred to an electrically pointable antenna "which reads on one dimensionally pointable antenna." Office Action page 7. In the rejection, Examiner at no point introduced a reference, or even discussed, a one dimensionally electronically pointable antenna mounted upon a motorized turntable. It was inappropriate for Examiner to reject claims without discussing each and every element of those claims.

In addition, the combination of Sklar and Ayyagari, does not teach or anticipate a one dimensionally electronically pointable antenna mounted upon a motorized turntable. Sklar only discloses a system with a pointable antenna and states that the pointable antenna "typically takes the form of a parabolic dish." Sklar column 6, line 2. Without commenting on the appropriateness of the Sklar reference in general, Applicant asserts that there is no disclosure of a configuration of an antenna, aside from being pointable and possibly parabolic. Sklar simply reveals nothing about the antenna except that it is pointable and possibly parabolic. There is no specific reference to an electrically pointable antenna, a shape of antenna other than parabolic, or any other feature of the antenna. Therefore, any suggestion of a different configuration of antenna, including a one dimensionally electronically pointable antenna mounted upon a motorized turntable, must be completely derived from a separate prior art reference. The separate prior art reference given by the Examiner, in combination with Sklar, to anticipate a one dimensionally electronically pointable antenna mounted upon a motorized turntable was Ayyagari. Accordingly, since Sklar makes no

reference, except as previously discussed (i.e. pointable and possibly parabolic), to the configuration of the antenna, any suggestion of a one dimensionally electronically pointable antenna mounted upon a motorized turntable must come completely from another reference. Ayyagari, as the reference cited by the Examiner, fails in this regard. Ayyagari makes no hint of combining an electrically pointable antenna with a turntable to produce a two dimensionally pointable antenna as claimed by Applicant.

Since Sklar does not teach about the details of the pointable antenna (aside from possibly being parabolic) and Ayyagari does not teach a combination of an electrically and mechanically pointable antenna, it was inappropriate for Examiner to base his §103(a) rejection of Applicant's Claims 1-10 and 12 on the combination of the two references. Coupled with Examiner's lack of specifically addressing the claimed element of a one dimensionally electronically pointable antenna mounted upon a motorized turntable, Applicant respectfully requests, independent of all other arguments proffered, that the rejection under §103(a) based in part on the combination of Sklar and Ayyagari be withdrawn.

In addition to the above stated arguments, Applicant also particularly asserts that the combination of Fukushima with Sklar was inappropriate on independent grounds. These grounds include those discussed below and those put forward by Applicant in Applicant's Amendment and Response dated May 13, 2005, which is hereby incorporated by reference.

In view of the foregoing, Applicant respectfully requests that Examiner withdraw the §103(a) rejection of Claims 1 and 12. Independent Claim 11 has been amended to incorporate dependent Claim 12. Therefore, in amended form, Claim 11 now is similar to former Claim 12, and all discussions above relating to Claim 12 apply to the new amended Claim 11. Therefore, for the reasons discussed above Applicant respectfully requests that Claims 1 and 11 be placed in condition for allowance. Since Claims 2-10 and 13-16 all depend on Claims 1 and 11, Applicant requests that these Claims also be placed in condition for allowance.

Rejection of Claims 11, and 15-16 under 35 U.S.C. §102(e) as Being Anticipated by Sklar

As discussed in the preceding section, Applicant has amended Claim 11 to incorporate the features of Claim 12. Therefore, the §102 rejection of Claim 11 is no longer applicable. Similarly, as amended Claims 15 and 16 depend on claim 12, the §102 rejection of Claims 15 and 16 is also no longer applicable.

Rejection of Claim 2 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Fukushima

Although as discussed above Applicant believes that Claim 2 should be placed in condition for allowance because it is dependent on Claim 1 which Applicant asserts should be placed in condition for allowance, Applicant also asserts that Claim 2 should be placed in condition for allowance on independent grounds.

Applicant asserts that the combination of elements disclosed in Claim 2 is a significant advancement over the prior art. These elements make the present claimed embodiment particularly well suited for receiving satellite signals under conditions where the satellite signal may periodically be interrupted, such as for example in an automobile driving through a city with many tall buildings. In such an application, the present claimed embodiment provides for rapid reacquisition of signals once any blockage is removed, a flat profile which does not significantly impede the aerodynamics of the vehicle to which it is attached, and a hybrid electronic and mechanical steering system (i.e. the system contains a one-dimensional electrically pointed antenna on a turntable) which reduces system cost and antenna complexity over an antenna that is electrically pointed in two dimensions.

Neither Sklar, Ayyagari, nor Fukushima, individually or in combination, produce all of the benefits of the present claimed embodiment described above. Therefore, Applicant respectfully requests that Claim 2 be placed in a condition for allowance.

Amendment to Claims 11 and 12

Formerly, Claim 12 was an independent claim which depended on Claim 11. Presently, Claim 11 has been amended to include the language and elements of former Claim 12. Accordingly, Claim 12 has been canceled. This change and its effects have been discussed above.

New Claim 17

Claim 17 is a new independent claim that recites several aspects of a system for receiving satellite transmissions in a vehicle that are disclosed throughout the specification. More specifically, Claim 17 claims, in independent form, a system comprising a combination electrically pointed and mechanically pointed antenna, and open-loop control, a closed-loop control, a signal lock capable of

switching between the open-loop and closed-loop controls, and a direct broadcast receiver. Each of these elements was disclosed in the original application.

New Claim 18

Claim 18 is a new claim dependent on Claim 17 and further claims that the signal lock of Claim 17 switches between open and closed-loop control on the basis of signal strength.

New Claim 19

Claim 19 is a new claim dependent on Claim 18 and further claims that the system of Claim 18 is substantially flat and conformal to the surface of a vehicle.

New Claim 20

Claim 20 is a new claim dependent on Claim 19 and further claims that the vehicle orientation determination system of Claim 19 further comprises an electronic compass and tilt sensor adapted to provide orientation data.

New Claim 21

Claim 21 is a new claim dependent on Claim 19 and further claims that the vehicle orientation determination system of Claim 19 further comprises a solid-state electromagnetic field sensor and a fluid-filled tilt sensor adapted to provide orientation data.

New Claim 22

Claim 22 and is a new claim dependent on Claim 19 and further claims that the vehicle orientation determination system of Claim 19 further comprises a Global Positioning System receiver to provide location data.

New Claim 23

Claim 23 is a new claim dependent on Claim 19 and further claims that the closed-loop control system of Claim 19 is capable of controlling both the rotational orientation of the turntable and the look-angle of the electronically-pointable antenna simultaneously.

New Claim 24

Claim 24 is a new claim dependent on Claim 19 and further claims that the open-loop control system of Claim 19 is capable of controlling both the rotational orientation of the turntable and the look-angle of the electronically-pointable antenna simultaneously.

Conclusion

Based upon the foregoing, Applicant believes that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, Examiner is invited to contact the undersigned.

Respectfully submitted,

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